

REMARKS

Status Summary

In this Amendment, no claims are canceled, and claims 97-107 are added. Therefore, claims 1-107 are pending. Claims 5-9, 22-33, 35-43, 48-86, 90-93, 95, and 96 have been withdrawn from consideration by Applicants' response to the species election requirement.

Elections/Restrictions

In Applicants' response to the species election requirement in the Official Action dated March 29, 2005, Applicants elected Species 1, Sub-Species 1, and indicated that claims 1-4, 10-21, 34, 44-47, 87-89, and 94 were readable on the elected species. In the Official Action dated May 31, 2005 (hereinafter, "current Official Action"), the Examiner indicated that claims 1-4 and 10-21 are readable on the elected species and that claims 34, 44-47, 87-89, and 94 are not readable on the elected species. Applicants respectfully disagree with the Examiner's conclusion that claims 34, 44-47, 87-89, and 94 are not readable on the elected species because the current Official Action defines the elected species more narrowly than the species election requirement in the Official Action dated March 29, 2005.

In the Official Action dated March 29, 2005, Species 1, Sub-Species 1 was defined as follows:

Species 1, drawn to a conductive yarn (as illustrated in Figure 1) and structure and/or process of making.

Sub-Species 1, drawn to a coaxial conductive yarn (as illustrated in Figure 1) and woven structure (as illustrated in Figure 3) and/or process of making.

In the current Official Action, Species 1, Sub-Species 1 is defined as follows:

The elected Species (Figure 1) and Sub-Species (Figure 3) is drawn to a woven structure wherein the yarns are parallel to each other but are separated from each other by non-conducting yarns (see Figure 3 and see pages 5, lines 9-12 and page 15, lines 16-22 of the current specification).

Claims 34, 44-47, 87-89, and 94 are readable on the original description of elected Species I and Sub-Species I. For example, the original description of Species I and Sub-Species I requires a coaxial yarn, a woven structure, and/or process of making. Independent claim 34 is directed to a fabric-based signal transmission system with non-conductive threads extending in one direction in a fabric and conductive threads being twisted around each other and around adjacent non-conductive threads in a fabric to form a leno weave. The terms "thread" and "yarn" are used interchangeably in the specification. For example, on page 7 at line 3, the present specification states, "as used herein, the term "thread" may be used interchangeably with the term "yarn". Thus, claim 34 meets the criteria of a conductive yarn, a woven structure, and is not specific as to whether the structure is a coaxial structure. Claim 34 is thus generic with regard to the original description of Species I, Sub-Species I.

Claims 44-47 depend from claim 34 and recite additional features that are within the original description of Species I, Sub-Species I. For example, these claims recite that the structure includes a third conductive thread that forms a coaxial structure with the first and second conductive threads. An example of the subject matter of claims 44-47 as illustrated in Figure 12 where threads **1202**, **1204**, and **1206** are twisted together to form a coaxial structure and around adjacent non-conductive threads to form a leno weave.

conductive threads together. Claim 87 is not specific to woven structures or coaxial structures and is thus generic with regard to the original description for Species I, Sub-Species I. Claims 88, 89, and 94 depend from claim 87 and recite features that are within the original description of Species I, Sub-Species I. For example, claim 88 recites weaving the conductive threads with the non-conductive threads. Claim 89 recites leno weaving the conductive threads with the non-conductive threads. Claim 94 recites interlocking three conductive threads together to form a coaxial structure. Thus, claims 87-89 and 94 are readable on the original description of Species I and Sub-Species I, which includes a coaxial yarn and a woven structure or process of making.

Accordingly, based on the foregoing, it is respectfully submitted that claims 34, 44-47, 87-89, and 94 are readable on the original description of Species I, Sub-Species I should be examined.

In support of Applicants' position that Species I, Sub-Species I should be interpreted based on its original description rather than the referenced figures, Applicants submit that the species election requirement is incomplete if each species and subspecies is limited to the referenced figures. For example, the species election requirement fails to mention Figures 8-14, 20, 22-24, and 32. Accordingly, it is respectfully submitted that the species election requirement should be interpreted in light of the original descriptions of the species and subspecies, which do not exclude embodiments of the invention described in the specification. Alternatively, Applicants respectfully request a new species election requirement that includes all of the embodiments described in the specification.

Claim Rejections under 35 U.S.C. § 102

Claims 1 and 4 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 2,073,923 to Herbst (hereinafter, "Herbst"). This rejection is respectfully traversed.

Independent claim 1 recites a coaxial conductive yarn structure including a first conductive yarn extending in a first direction in a fabric and having a plurality of conductive strands being twisted together. Independent claim 1 further recites a second conductive yarn having second conductive strands twisted together and wrapped around the first conductive yarn in a direction transverse to the first direction and covering the first conductive yarn. At least one insulating layer electrically isolates the first and second conductive yarns from each other. Claim 1 has been amended to more clearly recite Applicants' definition of the term "yarn" to include a structure that exhibits at least one of sufficient flexibility, conformability, resiliency, bending characteristics, and recovery required for incorporation in a wearable garment. Support for this amendment, is found, on page 13, lines 13-17 of the present specification. It should also be noted that in the present specification, the term "yarn" has been defined as excluding conventional wires. For example, the specification states:

The term yarn as defined above and is not intended to include conventional wires. (See page 13, lines 13-14 of the present specification.)

Thus, independent claim 1 recites a coaxial conductive yarn structure with yarns that have sufficient physical properties for incorporation in a wearable garment, and the term "yarn" is defined to exclude conventional wires.

There is absolutely disclosure, teaching, or suggestion in Herbst of a coaxial conductive yarn structure where the yarns have properties that make them suitable for incorporation in a wearable garment. Herbst is directed to a radio frequency distribution system that includes a transmission line 2 for distributing a signal to a plurality of receivers. There is absolutely no teaching or suggestion in Herbst that any of the conductors of the transmission line comprise yarns having physical properties suitable for incorporation in wearable garments. In contrast, Herbst states:

Other objects of the invention are to improve generally the simplicity and efficiency of electrical distribution systems, and more particularly to provide a radio frequency distribution signal, which is adapted for use in buildings and the like. (Emphasis added.) (See column 1, lines 32-36 of Herbst.)

From the above-quoted passage, Herbst teaches that transmission line 2 is suitable for incorporation in buildings, there is absolutely no teaching or suggestion that transmission line 2 is made of yarns that include physical properties making them suitable for incorporation in a wearable garment. Accordingly, for this reason alone, the rejection of claim 1 and dependent claim 4 as anticipated by Herbst should be withdrawn.

Claims 1 and 4 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 1,745,096 to Jayne (hereinafter, "Jayne"). This rejection is respectfully traversed.

As stated above with regard to the rejection of claim 1 as anticipated by Herbst, claim 1 recites a conductive yarn structure that includes first and second conductive yarns where the second conductive yarns is wrapped around the first conductive yarn, where an insulating layer electrically isolates the yarns, and where the yarns have at

least one of sufficient flexibility, conformability, resiliency, bending characteristics, and recovery for incorporation in a wearable garment. In addition, the term “yarn” has been defined in the specification to exclude conventional wires.

There is absolutely no teaching or suggestion in Jayne of a coaxial conductive structure that includes yarns, not to mention a structure that includes yarns having sufficient physical properties for incorporation in a wearable garment. Jayne is directed to an antenna for radio receiving sets that uses the wires of a home lighting circuit as a substantial portion of a radio antenna. (See lines 50-52 of Jayne.) None of the wires disclosed in Jayne are described as being yarns, not to mention yarns that are suitable for incorporation in a wearable garment. For example, the structure illustrated in Figure 2 of Jayne is illustrated in Figure 1 as being a structure that conducts power from a wall receptacle to structures 3 and 4 that branch off of conductor 5 to carry a portion of the power to the radio. There is absolutely no teaching or suggestion anywhere in Jayne that any of these structures are yarns, not to mention yarns with suitable physical properties for incorporation in a wearable garment. Accordingly, the rejection of claim 1 and dependent claim 4 as anticipated by Jayne should be withdrawn.

Claim Rejections 35 U.S.C. § 103

Claims 2 and 3 were rejected under 35 U.S.C. § 103(a) as unpatentable over Herbst as applied to claims 1 and 4 and further in view of U.S. Patent No. 3,795,760 to Raw et al. (hereinafter, “Raw”). This rejection is respectfully traversed.

As stated above with regard to the rejection of claims 1 and 4 as anticipated by Herbst, Herbst fails to disclose a coaxial conductive structure that includes yarns, not to mention yarns that have sufficient physical properties for incorporation in a wearable

likewise lacks such teaching or suggestion. Raw is directed to electrical cables suitable for wiring buildings, vehicles, aircraft, switchboards, equipment, and machinery. (See column 1, lines 6-11 of Raw.) There is absolutely no teaching or suggestion anywhere in Raw that any of the cables comprise yarns, not to mention yarns that exhibit sufficient physical properties for incorporation in a wearable garment. Accordingly, it is respectfully submitted that the rejection of claims 2 and 3 as unpatentable over Herbst in view of Raw should be withdrawn.

Claims 2 and 3 were rejected under 35 U.S.C. § 103(a) as unpatentable over Jayne as applied to claims 1 and 4 and further in view of Raw. This rejection is respectfully traversed.

Claims 2 and 3 depend from claim 1. As stated above with regard to the rejection of claim 1 as anticipated by Jayne, Jayne fails to teach a coaxial conductive structure where any of the conductors comprised yarns, not to mention yarns with sufficient physical properties for incorporation and wearable garment. Raw likewise lacks such teaching or suggestion. Raw is directed to electrical cables for industrial purposes. Neither Jayne nor Raw, when taken individually or when combined, discloses a coaxial conductive yarn structure with any conductive yarns, not to mention yarns with sufficient properties for incorporation in a fabric as claimed. Accordingly, it is respectfully submitted that the rejection of claims 2 and 3 as unpatentable over Jayne in view of Raw should be withdrawn.

Claims 10-12 and 15-21 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 5,906,004 to Lebby et al. (hereinafter, "Lebby") in view of Herbst in view of U.S. Patent No. 4,552,989 to Sass (hereinafter, "Sass"). This rejection is respectfully traversed.

Independent claim 10 recites a woven electrical network including a first coaxial conductive yarn structure woven into a fabric in a first direction. The first coaxial conductive yarn structure includes an inner conductive yarn, an outer conductive yarn that is wound around the inner conductive yarn in a second direction and that substantially covers the inner conductive yarn. At least one insulating layer electrically isolates the inner and outer conductive yarns. The network in claim 10 includes a second coaxial conductive yarn structure that is woven into the fabric and that also includes inner and outer conductive yarns. An AC signal source is coupled to the first and second coaxial conductive yarn structures.

There is absolutely no teaching or suggestion in Lebby of a woven electrical network that includes coaxial conductive yarn structures with inner and outer conductive yarns where one of the yarns is wound around the other yarn as claimed. Lebby is directed to a textile fabric with integrated electrically conductive fibers. However, the only electrically conductive fibers disclosed in Lebby are single-conductor fibers with a single inner conductor and no outer conductors. For example, in Figure 2 of Lebby, conductor **12** includes an inner conductor **16** and an insulating layer **18**. There is absolutely no teaching or suggestion of a woven electrical network with coaxial conductive yarn structures as claimed.

Nonetheless, the Official Action indicates as follows:

Lebby discloses that the fibers may be any conductive fiber that is capable of transmitting a current (paragraph bridging columns 5 and 6), but Lebby does not specifically mention the claimed conductive yarn structure. (See page 6, lines 4-9 of Official Action.)

The quoted portion of Lebby does not indicate that the conductive fiber can be “any conductive fiber that is capable of transmitting a current.” The paragraph bridging

columns 5 and 6 of Lebby lists different materials for conductive fibers but fails to mention any structure for such fibers. As stated above, the only conductive structure disclosed in Lebby is a single-conductor fiber. Accordingly, Lebby fails to teach or suggest a woven electrical network with first and second coaxial conductive yarn structures as claimed.

Herbst likewise lacks such teach or suggestion. As stated above, Herbst is directed to a conductor for radio frequency distribution. There is absolutely no teaching or suggestion that the transmission cable of Herbst comprises a yarn. In fact, Herbst indicates that the structures disclosed therein are suitable for radio frequency distribution in a building. (See lines 32-38 of Herbst.) Thus, the combination of Herbst and Lebby fail to teach a woven electrical network with first and second coaxial conductive yarn structures as claimed.

Sass likewise lacks such teaching or suggestion. Sass, is directed to a coaxial cable 10. There is absolutely no teaching or suggestion in Sass that cable 10 includes any yarns, not to mention coaxial conductive yarns as claimed. Moreover, the Official Action fails to indicate how Sass applies to claim 10 or claims 15-21. Accordingly, because the combination of Lebby, Herbst, and Sass fails to teach or suggest all of the elements of claim 10, it is respectfully submitted that the rejection of claims 10 and 15-21 as unpatentable over Lebby in view of Herbst in view of Sass should be withdrawn.

Moreover, even assuming for the sake of argument that the combination of Herbst, Lebby, and Sass yielded all of the elements of claim 10, it would not have been obvious to a person of ordinary skill in the art to combine these disclosures in the manner recited in the Official Action. For example, Lebby is directed to a textile fabric with single-conductor fibers. Herbst and Sass are directed to multiconductor coaxial

cables for distributing signals in buildings. Incorporating a single-conductor fiber in a fabric is known based on Lebby. However, incorporating coaxial structures in fabrics would not have been obvious to a person of ordinary skill in the textiles art because coaxial structures were conventionally limited to building wiring and it is believed that conventional cable manufacturing techniques would fail to produce a coaxial structure that is suitable for incorporation in a fabric. Moreover, the industrial coaxial cables of Herbst and Sass would not be suitable for incorporation in a woven electrical network as claimed because such cables would not be suitable for incorporation in a weaving process. For example, it is believed the coaxial cables of Herbst and Sass could not be incorporated into a fabric using textile weaving equipment available at the time the invention was made. Accordingly, a person of ordinary skill in the textiles art would not be led in light of the single-conductor fibers of Lebby to incorporate coaxial structures of Herbst or Sass into a fabric. Thus, for this additional reason, the rejection of claims 10-12 and 15-21 as unpatentable over Lebby in view of Herbst in view of Sass should be withdrawn.

Claims 13 and 14 were rejected as unpatentable over Lebby in view of Herbst in view of Sass as applied to claims 10-12 and 15-21 and further in view of Raw. This rejection is respectfully traversed.

Claims 13 and 14 depend from claim 10. As stated above, claim 10 includes first and second coaxial conductive yarn structures being woven in a fabric where each of the structures includes an inner yarn and outer yarn wound around the inner yarn. The combination of Herbst, Lebby, and Sass fails to teach the invention claimed in independent claim 10 for the reasons stated above. Raw likewise lacks such teaching or suggestion. Raw is directed to electrical cables and single wire conductors for use in

buildings, aircraft, vehicles, switchboard, equipment, and machinery. (See column 1, lines 5-15 of Raw.) There is absolutely no teaching or suggestion in Raw that any of the cables comprise yarns, not to mention coaxial conductive yarns as claimed. Thus, because the combination of Lebby, Herbst, Sass, and Raw fails to yield all of the elements of independent claim 10, it is respectfully submitted that the rejection of claims 13 and 14 as unpatentable over Lebby in view of Herbst in view of Sass and further in view of Raw should be withdrawn.

Moreover, it would not have been obvious to a person of ordinary skill in the art to combine the disclosures of Lebby with that of Herbst, Sass, and Raw in the manner recited in the Official Action. For example, it would not have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the disclosures of Lebby, Herbst, and Sass for the reasons stated above. The same reasoning applies to Raw. For example, Raw is directed to a cable suitable for wiring of buildings, vehicles, aircraft, switchboards, equipment and machinery. A person of ordinary skill in the textiles art would not be led in light of the single-conductor textile fibers of Lebby to incorporate building wiring as taught by Raw in a woven fabric because such wiring is unsuitable for a weaving process. Accordingly, for this additional reason, the rejection of claims 13 and 14 as unpatentable over Lebby in view of Herbst in view of Sass and further in view of Raw should be withdrawn.

New Claims

New claims 97-107 are added. Support for new claims 97-107 is found, for example on page 3, line 24 through page 4, line 16 and page 13, lines 11-22 of the present specification. New claims 97-101 are readable on both the original and new

descriptions of Species 1, Sub-Species 1. New claims 97-99 depend from claim 1 or claim 10. Accordingly, these claims are believed to be patentable over the references cited in the Official Action for the same reasons stated above, in addition to the additional elements recited in these claims.

New claims 102-105 are readable on the original description of Species 1, Sub-Species 1. For example, new claims 102 and 103 depend from claim 34 and recite that the conductive threads each have a diameter of less than twenty microns. New claim 104 also depends from claim 34 and recites that each of the first and second conductive threads include at least one of sufficient flexibility, conformability, resiliency, bending characteristics, and recovery for incorporation in a wearable garment. New claims 105 and 107 depend from claim 87 and recite that the conductive threads have diameters of less than twenty microns. New claim 107 depends from claim 87 and recites that the conductive threads exhibit at least one of sufficient flexibility, conformability, resiliency, bending characteristics, and recovery for incorporation in a wearable garment. New claims 102-107 are believed to be patentable over the references cited in the Official Action because of the elements recited in the corresponding independent claims in addition to the additional elements recited in claims 102-107.

CONCLUSION

If any small matter should remain outstanding after the Patent Examiner has had an opportunity to review the above Remarks, the Patent Examiner is respectfully requested to telephone the undersigned patent attorney in order to resolve these matters and avoid the issuance of another Official Action.

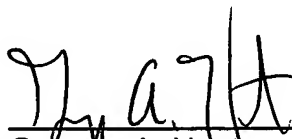
The Commissioner is hereby authorized to charge any fees associated with the filing of this correspondence to Deposit Account No. 50-0426.

Respectfully submitted,

JENKINS, WILSON & TAYLOR, P.A.

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